HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1938

GRADE IX

MATHEMATICS

ALGEBRA

Time—$1\frac{1}{2}$ hours.

Note: (*a*) Graph paper will be supplied by the presiding examiner.

(*b*) In questions 6, 11, 13, 14, 15, 17 and 19 full solutions are to be shown.

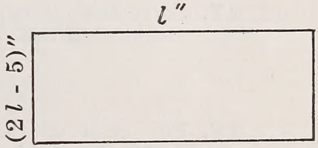
Values

1 **1.** Find the value of D eggs at c cents a dozen.

1 **2.** Reduce to lowest terms: $\dfrac{15(x+y)}{3y}$

1 **3.** How many factors are there in the expression $abc(2a+b+c)$?

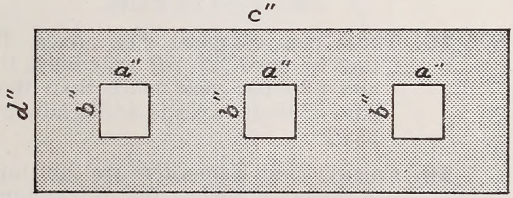
2 **4.** Write a formula for the perimeter of the rectangle on the right. (Use p for the perimeter.)



3 **5.** If, in the above rectangle, $p = 27$, find l.

2 **6.** If $r = 10\frac{1}{2}$, $s = 7\frac{1}{2}$ and $t = 4\frac{1}{4}$, find the value of $6r—7s+8t$.

2 **7.** Write the formula that will give the area of the shaded portion of the following figure.



2 **8.** How long should it take 2 men to do a job that M men can do in 9 hours?

15 $\frac{9}{M}$ $\frac{9M}{2}$

Values

2 **9.** The price of a bicycle is increased $x\%$. If the new price is $40, what was the old price?

10. Write the following statements as equations:

1 (*a*) The number $2n+9$ is 6 less than $4n-3$.

1 (*b*) Twice the sum of $n+2$ and r is 36.

1 (*c*) 15% of $(n+7)$ is 25 more than 12% of $(n-2)$.

3 **11.** Remove the parentheses and combine like terms: $9x^2+3x+2\ [2x-5x(x-1)-10]\ -\ (2x^2+7x)$

2 **12.** From $(3x^2-7x+9)$ subtract $(-5x^2+10x-2)$.

3 **13.** Find the product of $4a^2-5a+3$ and $5-2a$.

3 **14.** What is the remainder when $20a^3-22a^2+33a-18$ is divided by $5a-3$?

4 **15.** Solve the following equation and check the solution: $\frac{3}{5}N-2.4 = 7.2$

16. A cylinder has a base containing 5 square inches. The volume of the cylinder depends upon its height. Express the volume of this cylinder in terms of its height h:

2 (*a*) by a formula;

5 (*b*) by a graph. (Draw a graph that will show the volume of this cylinder for any height less than 10 inches).

6 **17.** Solve the following equation and verify the solution obtained:

$$\frac{x-2}{4}-\frac{x-4}{6}=\frac{2}{3}$$

18. For each of the following problems write the equation which may be used in its solution. (Write the equations, but do not solve them.)

4 (*a*) Two boys have together 150 marbles. One boy has 20 more than twice as many as the other. How many marbles has each boy?

4 (*b*) The width of a field is 40 rods less than its length. The perimeter of the field is 300 rods. Find its width.

7 **19.** Three men compare their taxes. The first finds that he pays $20 per year more than the second and $30 per year more than the third. If the sum of their taxes is $550, how much does each pay?

20. Calgary and Edmonton are 200 miles apart. Car A leaves Calgary for Edmonton at the same instant that car B leaves Edmonton for Calgary. The accompanying graph pictures the journey made by each car. From the graph answer the following questions:

Values

1 (*a*) At what time does car A arrive at Edmonton?

2 (*b*) What was the average speed of car A between Calgary and Edmonton?

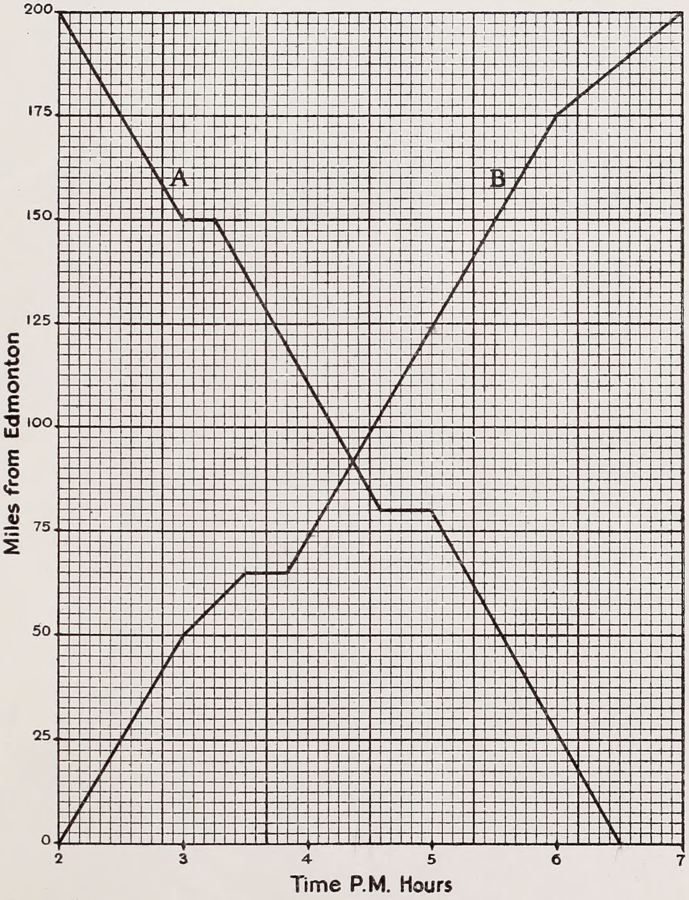
2 (*c*) At what speed was car B travelling when it met car A?

2 (*d*) How far was car B from Calgary when it stopped for several minutes?

3 (*e*) At what time did the cars meet?

3 (*f*) How far from Calgary were the cars when they met?

75



Graph Showing Journeys Made by Cars A and B— —on Highway No. 1, on September 30, 1937.